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TPGITF USER'S MANUAL

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16. ABSTRACT Presented is a description of the TPG Interface (TPGITF) Software. This processor has been developed to utilize the test patterns generated by the TPG software to generate excitation input for the LOGSIM simulator and to generate TOIL test sequences for the MACRODATA-200 LSI Tester. It is assumed that the reader is familiar with the TPG, LOGSIM, and TOIL systems; no attempt is made therefore to describe any of these systems unless it is peculiar to the operation of the DJANAL software.			
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PREFACE

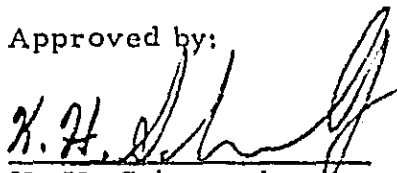
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1. INTRODUCTION

The primary purpose of the TPG software is to create test patterns, according to a mathematical model, for a real device. In order for the device actually to be tested or to be accurately simulated, a means is required to transform the TPG generated test into forms acceptable as input to logic test equipment or to a software logic simulator. The MACRODATA-200 Logic Test System and the LOGSIM logic simulator are the particular systems supported by the TPGITF software.

The ability of the MD-200 logic tester to retrieve Test-Oriented Interactive Language (TOIL) commands from an off-line recorded magnetic tape provides the essential link between the TPG system and the device under test. The MD-200 operator, after issuing the appropriate test setup commands, can instruct the TOIL software to accept commands from the magnetic tape unit by using the "DIRECT" directive. Once control is given to the magnetic tape, the test will be executed automatically according to the commands generated by the TPGITF software. Since the MD-200 hardware has only limited capability for representing "don't cares," TPGITF will produce a separate test sequence for each device output. The random bit mask (register 0) will be utilized to ignore device response at those times indicated by the TPG output. An option has been provided in the TPGITF program for the entire set of tests to be executed before control is given back to the operator or for control to be returned to the operator following test setup for each output. In the latter case, the operator is obliged to invoke test execution by using the TOIL "EXECUTE" directive. Following execution of the test, he may cause the next test setup to be loaded by issuing another "DIRECT" directive to magnetic tape. Since the TPGITF program generates "line modification" commands to change the test setup, it is imperative that the operator follow the instructions outlined in Section 2.4. Failure to do so will cause the wrong test lines to be modified and certainly will produce unpredictable and erroneous results.

When interfacing for LOGSIM, the TPGITF software deals only with the device inputs to create LOGSIM "GENF" cards. One or more "GENF" cards will be produced for each device input. The collection of "GENF" so produced may be merged subsequently with an appropriate model deck for the device with which a logic simulation may be obtained.

2. OPERATING INSTRUCTIONS

This section consists of instructions for preparing TPGITF input information, a description of the output produced by TPGITF, and job setup instructions for running on the Sigma 5 computer. Also presented is the sequence of TOIL commands the operator must execute prior to directing the MD-200 to obtain input from magnetic tape. Presented in Table 2-1 is summarizing information for each of the files utilized and produced by the TPGITF program.

2.1 Input Files

TPGITF utilizes a control input deck and three of the files produced by the TPG software. The format and content of the control input deck is shown in Tables 2-2 and 2-3 for MD-200 and LOGSIM interfacing, respectively. The three TPG files required are the INPUT processor output file, the OVERLAY processor output file, and the SIMULATOR output file. Note that running of the TPG SIMULATOR is required in order to obtain all required files.

2.2 Output Files

Output generated by TPGITF consists of a file appropriate for use as input to the target system (MD-200 or LOGSIM) and list output which provides a hardcopy of the results of the process. Output generated for the MD-200 consists of TOIL commands necessary to test the device in accordance with the results produced by TPG. The sequence of commands to be expected is diagrammed in Figure 2-1. Output produced for LOGSIM consists simply of "GENF" cards in which the zero-one bit patterns have been mapped into the required LOGSIM format.

2.3 Sigma 5 Job Setup Instructions

Presented below is the deck setup required to execute TPGITF on the Sigma 5 computer under the CP-V operating system.

```
!JOB USER,ACCOUNT  
  
!ASSIGN F:1,(FILE,TPGOUT1),(IN)  
  
!ASSIGN F:2,(FILE,TPGOUT2),(IN)  
  
!ASSIGN F:3,(FILE,TPGOUT3),(IN)  
  
!ASSIGN F:5,(DEVICE,CR),(IN)  
  
!ASSIGN F:6,(DEVICE,LP),(OUT)
```

FILE CHARACTERISTICS SUMMARY

Logical Unit No.	Mode	Format	Description
1	Input	Binary	Output from TPG INPUT Processor
2	Input	Binary	Output from TPG OVERLAY Processor
3	Input	Binary	Output from TPG SIMULATOR Processor
5	Input	Card Images	TPGITF Control Input
6	Output	Line Images	TPGITF List Output
7	Output	Card Images	TOIL Test Sequence or LOGSIM GENF Cards per User Selection

Table 2-1

INPUT DECK FOR MD-200 INTERFACE

Card	Field	Description
1	1-6	Enter "MD-200" in cc. 1-6
	8	Blank for fully automatic test sequence. Non-blank for semi-automatic test sequence
2	1-4	TPG USER Node Number
	5-8	MD-200 register number to which user node is to be assigned
		Repeat Card Number 2 to fully specify register assignments

Table 2-2

INPUT DECK FOR LOGSIM INTERFACE

Card	Field	Description
1	1-6	Enter "LOGSIM" in cc. 1-6
	9-12	Time interval between logic levels
2	1-4	TPG USER Node Number
	5-12	Name that is to be assigned to user node number Repeat Card Number 2 as required to assign a name to all user node numbers

Table 2-3

TOIL COMMAND SEQUENCE

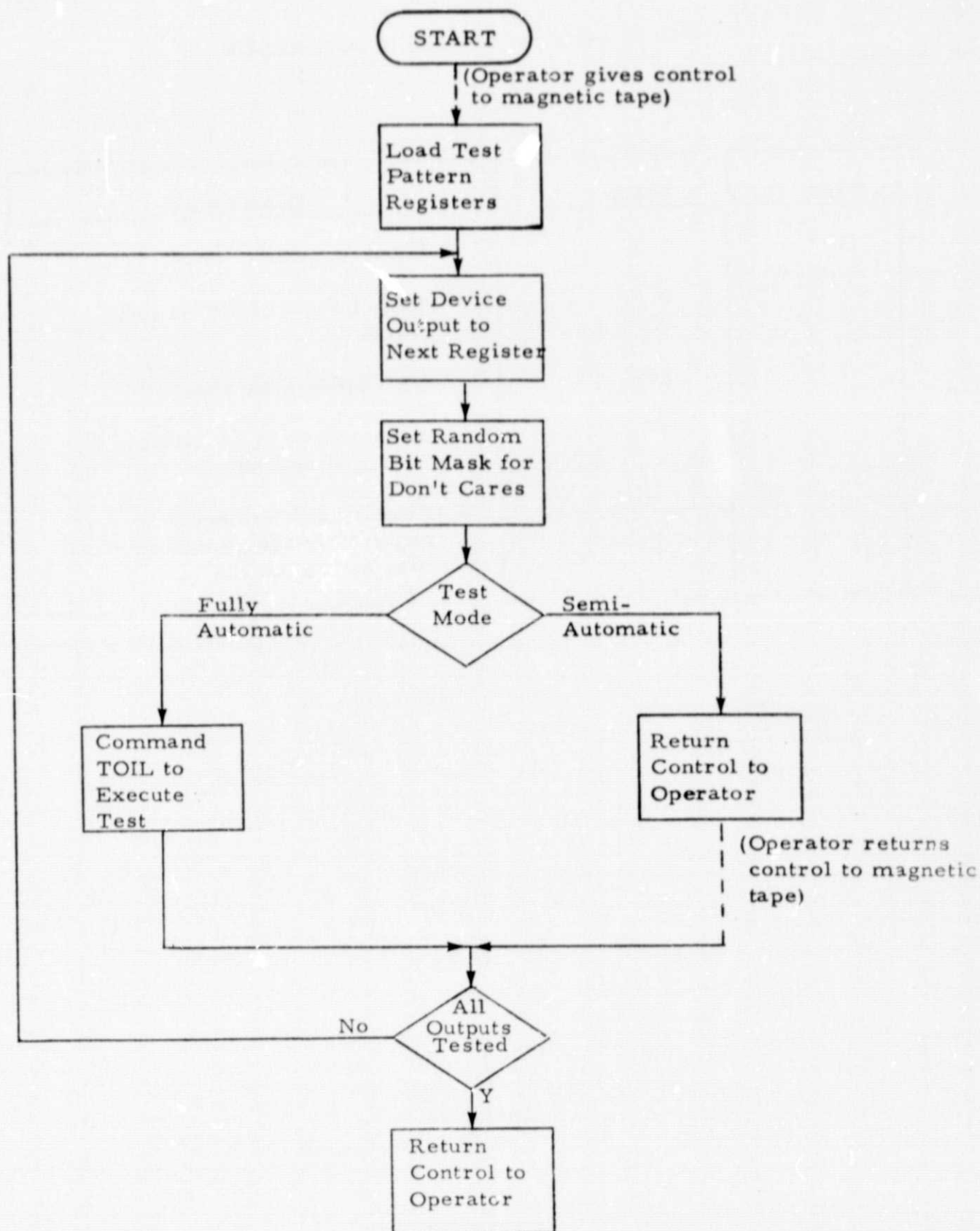


Figure 2-1

!ASSIGN F:7, (FILE, TPGITFOUT), (OUT), (SAVE)

!RUN (LMN, TPGITF)

!DATA

:

CARD INPUT DECK

:

!FIN

Where:

TPGOUT1 is the output of the TPG INPUT processor

TPGOUT2 is the output of the TPG OVERLAY processor

TPGOUT3 is the output of the TPG SIMULATOR

TPGITFOUT is the output from TPGITF

2.4 MD-200 Test Setup Procedure

As mentioned previously, the MD-200 operator must set-up the tester in a precise manner for the TPGITF generated test sequence to work properly. This requirement is due to the fact that TOIL line number modifications are used to change test parameters as each separate output is tested. Presented below is the procedure recommended for proper integration of the TPGITF generated test sequence.

- o In response to first "YES SIR", execute a GO TO IDEN directive.
- o Cycle through the IDEN sequence responding to TOIL prompts as is appropriate.
- o In response to second "YES SIR", execute a GO TO LOGI directive.
- o Cycle through the LOGI sequence responding to TOIL prompts to identify device inputs, phase clocks, etc., to properly set-up test. Note that the random bit mask option must be answered with : YES.

- o In response to third "YES SIR", execute a
DIRECT = MAG directive.

At this point, depending on whether fully automatic or semi-automatic testing was chosen when TPGITF was run, the entire test for the device will be run or the MD-200 will be set-up for execution of the test for the first output register. If the former was chosen, no further special instructions are required. If the latter option was chosen, the operator issues the following commands repetitively until all outputs have been tested.

- o In response to "YES SIR", execute an
EXECUTE LINE 1 THRU LINE 999 directive.
- o In response to "YES SIR", execute a DIRECT = MAG
directive.

2.5 Preparing the MD-200 Tape

Since the MD-200 tape handler requires that the tape be formatted in ASCII code, a means must be provided to convert the code of the host computer to that required for the tape. A separate program for the conversion to ASCII has been prepared for execution on the Sigma 5 computer and is included in the TPGITF delivery package. This program or any other that is capable of writing an ASCII coded tape may be used to prepare the MD-200 tape. The job deck required to run the supplied program is presented below.

```
!JOB USER,ACCOUNT
!LIMIT (TIME, 5), (9T, 1)
!ASSIGN F:5, (FILE, TPGITFOUT), (IN)
!ASSIGN F:1, (DEVICE, 9T), (OUT), (SN, M200), (BCD)
!RUN (LMN, ASCITW)
!FIN
```